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ABSTRACT

Learning Through Automotive Electronics (Project LETAE) was a federally funded program serving 77 limited-English-proficient (LEP) students and 5 English-proficient students in an automotive computer electronics course in 1992-93, its third year of operation. The program provided instruction in English-as-a-Second-Language (ESL), native language arts (NLA), automotive electronics, mathematics, science, social studies, and music. A broad range of staff and curriculum development activities were also included. The project met its objectives for student attitudes toward school, cultural awareness, support services, dropout prevention, and curriculum development. It did not meet its objectives in NLA, attendance, or staff awareness. Attainment of the objective for ESL could not be measured. Two major recommendations for program improvement include: use of the specified ESL test or revision of the ESL objective; and improved parental involvement, perhaps beginning with a needs assessment survey. (MSE)

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ED 370 409

OER Report

Learning English Through Automotive Electronics
(Project LETAE)
Transitional Bilingual Education Grant T003A00189
FINAL EVALUATION REPORT
1992-93

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Learning English Through Automotive Electronics
(Project LETAE)
Transitional Bilingual Education Grant T003A00189
FINAL EVALUATION REPORT
1992-93

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EXECUTIVE SUMMARY

Learning English Through Automotive Electronics (Project LETAE) was an Elementary and Secondary Education Act (E.S.E.A.) Title VII-funded project in its third year of operation in 1992-93. The project, at Automotive High School in Brooklyn, served 77 students of limited English proficiency (LEP) as well as five English proficient (EP) students who were admitted to the automotive computer electronics component. This represented a decrease of six students over the previous year. Participating students received instruction in English as a second language (E.S.L.); native language arts (N.L.A.); automotive electronics; the content area subjects of mathematics, science, social studies; and music. The project also included a broad range of staff and curriculum development activities.

Project LETAE was unable to offer the planned E.S.L. and General Education Diploma (G.E.D.) classes to the parents and adult siblings of project students. Additional Title VII funds were expected, however, and the project hoped to offer these parent classes in the year following the one under review.

The project met its objectives for attitude toward school, cultural awareness, and support services. It also met its dropout prevention and curriculum development objectives. Project LETAE did not meet its objectives in N.L.A., attendance, or staff awareness. OREA could not measure the E.S.L. objective as stated because the specified test was not used.

The conclusions, based on the findings of this evaluation, lead to the following recommendations to the project:

- Either use the CREST as called for in the E.S.L. objective or seek to change to the Language Assessment Battery to evaluate this objective.
- Seek more parental involvement, possibly by beginning with a needs-assessment survey.

ACKNOWLEDGEMENTS

This report has been prepared by the Bilingual, Multicultural, and Early Childhood Evaluation Unit of the Office of Educational Research.

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I. INTRODUCTION

This report documents the Office of Research, Evaluation, and Assessment's (OREA's) evaluation of the Elementary and Secondary Education Act (E.S.E.A.) Title VII project, Learning English Through Automotive Electronics (Project LETAE).

PROJECT CONTEXT

Automotive High School is a single-trade vocational school that draws students from all over New York City. Registration for the 1992-93 school year was 1,493. The building was newly renovated and the classrooms were spacious and well-lit. Student and teacher displays were apparent in many hallways and classrooms. Classroom bulletin boards had separate areas for Project LETAE work, such as students' booklets. The halls were very noisy. Computers were accessible in the automotive classes, and students made constant use of them.

STUDENT CHARACTERISTICS

Project LETAE served a total of 82 students. Seventy-seven of these students were of limited English proficiency (LEP) as determined by scores at or below the 40th percentile on the Language Assessment Battery (LAB). Five were English proficient (EP) students who were admitted to the automotive electronics computer component of the program. (For number of students by grade, see Table 1). Among the considerations for admission were poor performance on teacher-made tests of English language fluency, referrals from teachers or from the Office of Pupil Personnel Services, and parental requests.

TABLE 1

Number of Students in Project LETAE, by Grade

Grade				
9	10	11	12	Total
11	43	16	12	82

Of the 82 students served, 2 were female and 80 male. For countries of birth, please see Table 2. Many students in Project LETAE's target population had recently immigrated to the United States. All of the target students were eligible for the free-lunch program, an indication of low income.

TABLE 2

Students' Countries of Origin

Country	Number of Students
Dominican Republic	23
United States	12
Mexico	11
Puerto Rico	11
Honduras	7
Guatemala	5
Ecuador	3
El Salvador	3
Panama	3
Colombia	2
Costa Rica	1
Nicaragua	1
Total	82

Needs Assessment

Before instituting this program, Automotive High School conducted an exhaustive needs assessment of the targeted LEP population, their families, and the educational staff who were to serve them. The survey determined that the Latino LEP population at the site had not previously been served under the Title VII Bilingual Education Act and that students had a need for bilingual career orientation. It was also determined that they would benefit from the acquisition of pre-occupational automotive electronic skills. The data obtained from this study revealed three primary needs: (1) to provide students with pre-occupational automotive electronics skills; (2) to provide LEP students with intensive English language instruction and support services to improve their academic performance; and (3) to offer staff development activities for teachers and paraprofessionals.

PROJECT OBJECTIVES

Student Objectives

- By the conclusion of the project period, it is expected that 80 percent of the target students will demonstrate an appropriate increase in English language proficiency as indicated by mastery of one English syntax objective per 20 days of instruction demonstrated on the appropriate level of the CREST (Criterion Referenced English Syntax Test).

- By the conclusion of the project period, it is expected that 85 percent of the Spanish-dominant participants will demonstrate a significant increase in Spanish language achievement as indicated by significant improvement at the .05 level of statistical significance when results on a teacher-made instrument are analyzed using a correlated *t*-test.

- By the conclusion of the project period, it is expected that 85 percent of all target students will demonstrate an improvement in attitude toward school as indicated by results on a 5-point scale inventory to measure interest in continuing education beyond their present grade, tabulating growth from pre-to post-testing and ascertaining the percentage of students gaining one scale point or more.

- By June 1993, it is expected that the program will organize at least three field trips for the targeted students at the school to historical museums and United Nations, the White House, etcetera, to increase their familiarity with American culture and citizenship.

- By the conclusion of the project period, all graduating students will meet with the bilingual career specialists for advisement at least three times during the school year.

- By the conclusion of the project period, the program will organize at least one conference for students in which representatives of business and industry will present information on career options and skills requirements.

- By the conclusion of the project period, it is expected that program students will have a significantly lower dropout rate than similar non-program students.

- By the conclusion of the project period, it is expected that, as a result of participating in the program, students' attendance will be significantly higher than that of mainstream students.

Staff Development Objectives

- By June 1993, it is expected that 80 percent of the staff in the program will demonstrate an increase in awareness of pupil needs and pupils' problems as indicated by a 5-point scale of problems and needs inventory, tabulating and ascertaining percentage of change.

- By June 1993, it is expected that 90 percent of program staff members will enroll in at least one university course each semester.

Curriculum Development Objectives

- By the third project year, the curriculum specialist will have developed or translated one subject matter-oriented instructional unit for teaching (E.S.L., mathematics, science, and social studies).

Parental Involvement Objectives

- By June 1993, it is expected that the proportion of program students' parents who participate in Open School Day/Evening will be equal to or greater than the proportion of mainstream students' parents who participate in this activity.

PROJECT IMPLEMENTATION

Project LETAE provided instructional and support services to 82 Spanish-speaking students and their families during the 1992-93 school year. The project's main goals were 1) to promote acquisition of skills in automotive electronics which could lead to future employment, and 2) to increase LEP students' skills in English language and content area subjects. The project also offered support services and multiple activities to foster students' knowledge of their own and other cultures and provided parental and staff development activities.

Materials, Methods, and Techniques

Project LETAE offered English as a Second Language (E.S.L.) at beginning, intermediate, advanced, and transitional levels. The project provided peer tutoring and the assistance of a bilingual paraprofessional in the content areas. The use of computer-assisted instruction (C.A.I.) in electronics also improved students' English skills, as they had to read commands, schematics, and flow charts in English.

Project students were given newspaper assignments once a week that involved reading an article and writing a summary of it. Teachers selected articles with an eye to heightening students' cultural awareness.

For a list of instructional materials used in the project, see Appendix A.

Staff Qualifications

Title VII staff. The project's Title VII staff consisted of a resource specialist and a paraprofessional who was fully funded by Title VII and a secretary who was partially funded by Title VII. For degrees and language proficiencies (teaching or communicative*), see Table 3. The resource specialist was responsible for staff development for the project, with special emphasis on training teachers in the automotive electronics component. The paraprofessional's responsibilities included assisting teachers in the classroom, finding appropriate Spanish-language textbooks, and assisting with translations of curriculum materials.

TABLE 3

Project Staff Qualifications

Position Title	Degree	Language and Proficiency
Resource Specialist	B.A.	Spanish CP
Paraprofessional	B.A.	Spanish CP
Secretary (Part-Time)	N.A.	N.A.

Other staff. Tax-levy funds paid the salaries of the project director and five classroom teachers who provided instructional services to project students. The project director has a master's degree and was teaching proficient in Spanish. All

*Teaching proficiency (TP) is defined as the ability to use LEP students' native language in teaching language arts or other academic subjects. Communicative proficiency (CP) is defined as a non-native speaker's basic ability to communicate and interact with students in their native language.

teachers were certified in the area in which they taught. Three teachers had bachelors degrees and two had masters. Four were teaching proficient in Spanish. The project did not submit information on the fifth teacher.

Staff development. The teaching staff participated in weekly and monthly staff development activities. Workshops focused on demonstration lessons, team teaching and co-teaching techniques, instructional consultation, new technologies, instructional guides, scholarship information, and lesson plans.

Instructional Time Spent on Particular Tasks

See Appendix B for examples of class schedules.

Length of Time Participants Received Instruction

Students had a mean of 5.4 years (s.d.=2.4) of education in a non-English speaking school system and 5.1 years (s.d.=2.4) of education in the United States. The median amount of time students had participated in Project LETAE was 20 months.

Activities to Improve Pre-referral Evaluation Procedures

Students whom teachers thought were in need of special education services were referred to the guidance counselor. When appropriate, the counselor would refer the student to the Committee on Special Education (C.S.E.) and/or the School-Based Support Team (S.B.S.T.), consisting of a psychologist, social worker, and educational evaluator. Two members of the S.B.S.T. at Automotive High School were fluent in Spanish.

Gifted and talented students were identified by teacher judgment.

Instructional Services for Students with Special Needs

The project did not provide special education programming. Students needing such a program would be placed in one based on their evaluation by the S.B.S.T. and the C.S.E.

Students identified as gifted and talented were provided with an individualized program which permitted them to study more advanced topics in automotive electronics. Some of these students also participated in the extended-day program in automotive electronics.

PARENT AND COMMUNITY INVOLVEMENT ACTIVITIES

Project LETAE parents participated in Automotive High School's Open School Day/Evening. The project also held additional activities to encourage parental involvement, including two weekend workshops on automotive electronics education. Parents of incoming students were offered a weekend orientation workshop.

II. EVALUATION METHODOLOGY

EVALUATION DESIGN

Project Group's Educational Progress as Compared to That of an Appropriate Non-Project Group

OREA used a gap reduction design to evaluate the effect of language instruction on project students' performance on standardized tests. Because of the difficulty in finding a valid comparison group, OREA used instead the groups on which the tests were normed. Test scores are reported in Normal Curve Equivalents (N.C.E.s), which are normalized standard scores with a mean of 50 and a standard deviation of 21.1. It is assumed that the norm group has a zero gain in N.C.E.s in the absence of supplementary instruction and that participating students' gains are attributable to project services.

Applicability of Conclusions to All Persons Served by Project

Data were collected from all participating students for whom there were pre- and posttest scores. (There were no pretest data on students who entered the program late; therefore, posttest data for them will serve as pretest data for the following year.) Instruments used to measure educational progress were appropriate for the students involved. The LAB is used throughout New York City to assess the growth of English, Spanish, and mathematics skills in populations similar to those served by Project LETAE.

INSTRUMENTS OF MEASUREMENT

OREA compared pre- and posttest scores on the LAB to assess the E.S.L.

objective. The N.L.A. and content area objectives in mathematics, science, and social studies were assessed through course grades, as specified.

All students were tested at the appropriate grade level. The language of the LAB was determined by the test itself.

According to the publishers' test manuals, all standardized tests used to gauge project students' progress are valid and reliable. Evidence supporting both content and construct validity is available for the LAB. Content validity is confirmed by an item-objective match and includes grade-by-grade item difficulties, correlations between subtests, and the relationship between the performance of students who are native speakers of English and students who are LEP. To support reliability, the Kuder-Richardson Formula 20 (KR20) coefficients and standard errors of measurement (SEM) are reported by grade and by form for each subtest and total test. Grade reliability coefficients, based on the performance of LEP students on the English version, ranged from .88 to .96 for individual subtests and from .95 to .98 for the total test.

To assess students' attitudes toward school, OREA developed, distributed, and analyzed a Likert-type questionnaire. (See Appendix C.)

To assess growth of awareness of pupil needs and problems by staff, OREA developed and distributed a questionnaire to participating staff members. (See Appendix C.)

DATA COLLECTION AND ANALYSIS

Data Collection

To gather qualitative data, an OREA evaluation consultant carried out on-site and telephone interviews with the project director several times during the school year and also observed two classes on each of two visits. The project evaluator collected the data and prepared the final evaluation report in accordance with the New York State E.S.E.A. Title VII Bilingual Education Final Evaluation Report format, which was adapted from a checklist developed by the staff of the Evaluation Assistance Center (EAC) East in consultation with the Office of Bilingual Education and Minority Language Affairs (OBEMLA).

Proper Administration of Instruments

Qualified personnel received training in testing procedures and administered the tests. Test administrators followed guidelines set forth in the manuals accompanying standardized tests. Time limits for subtests were adhered to; directions were given exactly as presented in the manual.

Testing at Twelve-Month Intervals

Standardized tests were given at 12-month intervals, following published norming dates.

Data Analysis

Accurate scoring and transcription of results. Scoring, score conversions, and data processing were accomplished electronically by the Scan Center of the Board of Education of the City of New York. Data provided by the Scan Center were analyzed

in the Bilingual, Multicultural, and Early Childhood Evaluation Unit of OREA. Data collectors, processors, and analysts were unbiased and had no vested interest in the success of the project.

Use of analyses and reporting procedures appropriate for obtained data. To assess the significance of students' achievement in English, Spanish, and mathematics, OREA computed a correlated *t*-test on the LAB N.C.E. scores. The *t*-test determined whether the difference between the pre- and posttest scores was significantly greater than would be expected from chance variation alone.

The only possible threat to the validity of any of the above instruments might be that LAB norms were based on the performance of English Proficient (EP) rather than LEP students. Since OREA was examining gains, however, this threat was inconsequential—the choice of norming groups should not affect the existence of gains.

PARTICIPANTS' EDUCATIONAL PROGRESS

Project LETAE carried out almost all of the instructional activities specified in its original design. The project did not have the funds, however, to offer E.S.L. and General Education Diploma (G.E.D.) classes to the parents and adult siblings of project students as specified in its design. Additional funds for these classes were expected to be available in the year following the one under review.

LEP Participants' Progress in English

Project LETAE provided students with a variety of opportunities to develop their English language skills. Teachers assigned readings in English and provided students with vocabulary and preparatory questions before the readings were discussed in class. The project emphasized peer tutoring and cooperative learning techniques.

At Automotive High School, the OREA consultant observed a LEP class of 15 students who were discussing the play *Twelve Angry Men*. The objective of the lesson was for the students to learn how to tell the difference between fact and assumption by determining if the defendant was guilty or innocent. The students participated actively in the lesson, and their interest appeared to be sustained throughout.

The evaluation objective for English as a second language was:

- By the conclusion of the project period, it is expected that 80 percent of the target students will demonstrate an appropriate increase in English language proficiency as indicated by mastery of one English syntax objective per twenty days of instruction demonstrated on the appropriate level of the CREST (Criterion Referenced English Syntax Test).

Although Project LETAE called for the use of the CREST instead of the LAB, OREA had pre- and posttest scores on the LAB for 61 students from grades nine through twelve. These showed a significant increase ($p<.05$) overall as well as in scores for the ninth to eleventh grades. (See Table 4.)

Because of the change in tests OREA was unable to evaluate the objective as stated.

Participants' Progress in Native Language Arts.

Students in all N.L.A. classes were assigned readings in Spanish. They read passages aloud, discussed them, and wrote essays summarizing the material or relating it to real-life experiences.

The evaluation objective for N.L.A. was:

- By the conclusion of the project period, it is expected that 85 percent of the Spanish-dominant participants will demonstrate a significant increase in Spanish language achievement as indicated by significant improvement at the .05 level of statistical significance when results on a teacher-made instrument are analyzed using a correlated *t*-test.

A correlated *t*-test cannot be used on a teacher-made test, since there is no norming group. Final course grades were used instead as the evaluation indicator and indicated a passing percentage of 47.4 in fall and 48.1 in spring. (See Table 5.)

The project did not achieve the N.L.A. objective nor did it meet this objective in the previous year.

TABLE 4

Pretest/Posttest N.C.E. Differences on the
Language Assessment Battery

Grade	Total number of project students	Number of students for whom data were available	Pretest		Posttest		Difference		*t* value
			Mean	S.D.	Mean	S.D.	Mean	S.D.	
9	11	9	9.6	12.0	15.8	15.1	6.2	8.1	2.30*
10	43	31	15.6	10.8	18.8	13.1	3.2	8.7	2.05*
11	16	11	6.5	6.7	17.7	8.4	11.3	9.0	4.14*
12	12	10	25.7	14.9	15.9	12.8	-9.8	12.3	-2.52
Total	82	61	14.7	12.5	17.7	12.4	3.0	11.1	2.08*

*$p < .05$

- Overall, Project LETAE students showed a significant increase in LAB scores.

TABLE 5

Passing Grades in Native Language Arts

Grade	Fall 1992		Spring 1993	
	Number of students for whom data were reported	Percent Passing	Number of students for whom data were reported	Percent Passing
9	1	0.0	9	66.7
10	25	44.0	17	35.3
11	11	54.5	1	100.0
12	1	100.0	Not Available	—
Total	38	47.4	27	48.1

LEP Participants' Academic Achievement

Project teachers taught mathematics and social studies in Spanish. Science and music were taught in English with an E.S.L. methodology. Teachers used a wide array of strategies and techniques, with particular emphasis on peer tutoring.

An OREA evaluator observed a tenth grade mathematics class, on how to find points on a graph. The teacher used Spanish supplemented with English. Students went to the board to find points on a diagram, and the teacher assisted individuals who were having difficulty. The students were attentive and motivated throughout the lesson.

Project LETAE did not propose a content area objective.

Automotive Electronics

Courses in automotive electronics were taught with a hands-on approach. Automotive engines, computers, and electronic diagnostic equipment were available and used extensively by students.

OREA evaluators observed two automotive electronics classes. In the tenth grade class, the teacher instructed in English. As students identified parts of an automobile engine, a computer indicated whether they were correct; a paraprofessional offered explanations in Spanish as necessary. The interaction between students and staff was excellent.

An eleventh grade automotive electronics class focused on computerized scanner diagnosis of automobile engines. The teacher instructed in English. Each student had a scanner diagnostic worksheet and engaged in hands-on problem-solving. Students were highly motivated and worked individually or in small groups to solve problems. The teacher and a paraprofessional circulated around the room to answer questions, the latter using Spanish as necessary for clarification.

FORMER PARTICIPANTS' ACADEMIC PROGRESS IN ENGLISH LANGUAGE CLASSROOMS

One student was mainstreamed at the end of the school year previous to the one under review. That student's subsequent performance was not monitored by Project LETAE.

OVERALL EDUCATIONAL PROGRESS ACHIEVED THROUGH PROJECT

Attitude Toward School

- By the conclusion of the project period, it is expected that 85 percent of all target students will demonstrate an improvement in attitude toward school as indicated by results on a 5-point scale inventory to measure interest in continuing education beyond their present grade, tabulating growth from pre-to post-testing and ascertaining the percentage of students gaining one scale point or more.

OREA designed and distributed a Likert-Scale questionnaire with values of one through five to assess change in students' attitudes toward school. Project LETAE returned 54 forms. The mean score was 4.8, with 96.3 percent of the students indicating an improved attitude toward school.

The project met its objective for improvement in student attitude toward school. It did not meet this objective in the year previous to the one under review.

Cultural Awareness

The project proposed one objective for students' cultural awareness:

- By June 1993, it is expected that the program will organize at least 3 field trips for the targeted students at the school to historical museums and United Nations, White House, etcetera to increase their familiarity with American culture and citizenship.

Project students went on a field trip to the Metropolitan Museum of Art, Museum of Natural History, New York Hall of Science, and the Intrepid Air-Sea-Space Museum. Students also attended a performance of the Ballet Hispanico at the Borough of Manhattan Community College.

The project met its objective for student cultural awareness, as it had in the previous year.

Career Development

Project LETAE's career development objective was:

- By the conclusion of the project period, the program will organize at least one conference for students in which representatives of business and industry will present information on career options and skills requirements.

The project sponsored a workshop offered by the Technology Career Institutes at the College for Technology.

Project LETAE met its career development objective, as it did in the year prior to the one under review.

Support Services

Project LETAE proposed the following support services objective:

- By the conclusion of the project period October 1992 through September 1993, all graduating students will meet with the bilingual career specialists for advisement at least three times during the school year.

In addition to meeting at least three times with a bilingual career specialist, students were also visited in the classroom on eight occasions by a counselor who gave information on diploma requirements, options after high school, and college entry and financial aid programs. Representatives of colleges, technical schools, the military, and employment agencies also spoke to students.

Project LETAE met its objective for providing support services to students, as it had the year before.

Grade Retention

Project LETAE did not propose an objectives for grade retention. As in the previous year, no project students were retained in grade.

Dropout Prevention

The project offered an extended-day program to keep participants involved and interested. Staff made home visits to students with poor attendance records. In addition, older project students were trained as "buddies" for younger students who were at risk for dropping out of school.

Project LETAE proposed the following objective for dropout prevention:

- By the conclusion of the project period October 1992 through September 1993, it is expected that program students will have a significantly lower dropout rate than similar non-program students.

During the year under review, none of the project students dropped out of school. The mainstream dropout rate was 11 percent.

Project LETAE met its dropout prevention objective.

Attendance

The project's objective for attendance was:

- By the conclusion of the project period, it is expected that, as a result of participating in the program, students' attendance will be significantly higher than that of mainstream students.

The attendance rate for project students during the period under review was 85.3 percent. The schoolwide attendance rate during the same period was 85.0 percent. Project students' attendance was slightly higher than mainstream students', although this difference was not statistically significant ($p < .05$).

The project did not meet its objective for attendance this year; this objective was not met last year either.

Placement in Gifted and Talented Programs

None of the students were identified as gifted and talented during the period under review. Such students would have been offered an individualized course of study in advanced automotive electronics.

Enrollment in Post-secondary Education Institutions

Eleven graduating seniors indicated that they would be enrolling in postsecondary educational institutions upon graduation. Last year, no graduating project students planned on enrolling in postsecondary institutions.

CASE HISTORY

P.N. was born in El Salvador and emigrated to New York in 1986. He enrolled in the ninth grade of the Automotive High School in September 1992 as a LEP student. The structure of the bilingual program, along with his desire to succeed and the support he received from home, led to good progress in language development. By the spring of 1993 he was EP—his LAB score was in the 43rd percentile.

STAFF DEVELOPMENT OUTCOMES

Project LETAE engaged in a variety of staff development activities during the 1992-93 school year. The project staff trained four teachers in the use of automotive equipment and electronics as well as in curriculum development. The project staff outlined and designed a pilot course for tenth year electronics classes and conducted a workshop for all ninth and tenth grade teachers on the use of scanners. Ten teachers participated in an ongoing New York State Auto Teacher Training Program in computer development. Five teachers received training in the whole language technique for use with LEP students.

Project LETAE proposed the following staff development objectives:

- By June 1993, it is expected that 80 percent of the staff in the program will demonstrate an increase in awareness of pupil needs and pupils' problems as indicated by a 5-point scale of problems and needs inventory, tabulating and ascertaining percentage of change.

An OREA-developed five-point Likert scale was distributed at the end of the school year to measure project staff's awareness of pupils' needs and problems. Six of the eight forms (75 percent) were returned, and they demonstrated an increase in awareness of pupils' needs and problems.

The project came close, but did not meet its staff awareness objective. The project did not meet this objective in the previous year.

- By June 1993, 90 percent of program staff members will enroll in at least one university course each semester.

Program records indicated that both Title VII project professional staff members (100 percent) were enrolled in university courses during the fall and spring semesters.

The project met its objective for teacher enrollment in university courses.

CURRICULUM DEVELOPMENT OBJECTIVES

Project LETAE proposed one curriculum development objective:

- By the third project year, the curriculum specialist will have developed or translated one subject matter-oriented instructional unit for teaching (E.S.L., mathematics, science, and social studies).

Project staff translated lesson plans for a ninth grade electronics laboratory class.

The project met its objective for curriculum development.

PARENTAL INVOLVEMENT OUTCOMES

Project LETAE held a number of activities to encourage parental involvement in their children's education. In addition to the Open School Day/Evening, the project offered parents two weekend workshops on automobiles and automotive education. A weekend open house for the parents of incoming students was designed to familiarize them with Project LETAE and Automotive High School.

Project LETAE's parental involvement objective was:

- By June 1993, it is expected that the proportion of program students' parents who participate in Open School Day/Evening will be equal to or greater than the proportion of mainstream students' parents who participate in this activity.

Two hundred and two parents of project students attended Open School Day/Evening in the fall. Information was not submitted for the spring, or for mainstream parents' attendance.

OREA was unable to evaluate the parent involvement objective for lack of data.

IV. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

ACHIEVEMENT OF OBJECTIVES

The project met its objectives for attitude toward school, cultural awareness, career development, and support services. It also met its dropout prevention and curriculum development objectives. Project LETAE did not meet its objectives in N.L.A., attendance, or staff awareness. OREA could not measure the E.S.L. objective because the LAB was used instead of the CREST. The parental involvement objective could not be evaluated due to lack of data.

Participating students showed academic progress as evidenced by LAB scores. OREA had pre- and posttest scores on the LAB for 61 students from grades nine through twelve, which showed a significant increase ($p<.05$) in scores for the ninth to eleventh grades as well as overall.

Project services increased awareness of the importance of education. The dropout rate of participating students was lower than that of Automotive High School as a whole, and a majority of the project students indicated they had an improved attitude towards school.

Teachers attended graduate courses to increase their knowledge of bilingual education. The bilingual career specialist and counselor gave information on diploma requirements, options after high school, and college entry and financial aid programs.

MOST AND LEAST EFFECTIVE COMPONENTS OF THE PROJECT

The project director reported that the most effective component of Project LETAE was the program in automotive electronics. This component not only provided technical knowledge but increased computer and English literacy and served to increase students' self-confidence and their desire to perform. According to the project director, the least effective component of the program was parental involvement. The director felt that this was due, at least in part, to the fact that most project parents worked or lived at a distance from Automotive High School. Many of these parents had expressed an interest in their children's education, however, and Project LETAE stayed in touch with them by telephone. Next year, Project LETAE will offer E.S.L. and G.E.D. classes for parents and adult siblings of project students and will actively seek to involve more parents in the project.

RECOMMENDATIONS TO ENHANCE PROJECT EFFECTIVENESS

- Either use the CREST as called for in the E.S.L. objective or seek to change to the Language Assessment Battery to evaluate this objective.
- Seek more parental involvement, possibly by beginning with a needs-assessment survey.

APPENDIX A

Instructional Materials

E.S.L.

Grade	Title	Author	Publisher	Date of Publication
9-10	Cause and Effect	Patricia Ackert	Newbery House	1986

N.L.A.

Grade	Title	Author	Publisher	Date of Publication
9-11	Galería De Arte y Vida	Adey and Albini	McGraw-Hill	1989

Mathematics

Grade	Title	Author	Publisher	Date of Publication
9	Pre-Algebra	E.D. Nichols, et al.	Holt, Rinehart, and Winston	1980
10	Integrated Mathematics	Isidore Dressler Edward P. Keenan	AMSCO School, Inc.	1989

Science

Grade	Title	Author	Publisher	Date of Publication
9-10	La Matería y la Energía Ciencia	Heimler Price	Chas. E. Merrill	1985

Social Studies

Grade	Title	Author	Publisher	Date of Publication
9-10	Comprende tú Mundo: Su Historía, Sus Culturas	Killoran Zimmer	Jarrett Publishing Company	1991

APPENDIX B

Course Outline

	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1	Orientation Shop Card	Shop Safety, Elec. Safety	Intro. Elec. Tech.	Electrical Components	Recognize diff. kinds of parts
Week 2	Intro. Ed-lab	Wiring and Schematic	Series	Parallel	Control components
Week 3	Pot. Skill 3	Transistor	Photocell	Alarm System	Quiz
Week 4	Diode	Diode	Meters	Volt Meter	Current meter
Week 5	Resistor	Resistor	Capacitors	Inductors	Variable res.
Week 6	Timing	Auto Light	AC Curr.	A.C. Circuit	Inductor AC
Week 7	Diode	Transformer	Lamp Dimmer	Transistor	Radio Sig.
Week 8	Voltage Law	Curr. Law	Ohms Law	Ohms Law	Ohms Law
Week 9	Alarm Project	Alarm Project	Alarm Project	Alarm Project	Alarm Project
Week 10	Audio Project	Audio Project	Audio Project	Audio Project	Audio Project
Week 11	AC Generator	DC Power	OP Amp.	Power Supply	Lamp Flasher
Week 12	Radio Sig.	Resonance	Transmitter	Receiver	Testing

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APPENDIX C

Staff Awareness
Spring 1993

3 8
1 2

Program: **Project LETAE**

Directions:	Please write the numbers that show how you feel in the boxes on the right.

1. Since participating in Project LETAE, to what degree have you become **more aware** of students' needs?

Not more aware at all	1 2 3 4 5	Extensively interested

☐ 3

2. Since participating in Project LETAE, to what degree have you become **more aware** of students' problems?

Not more aware at all	1 2 3 4 5	Extensively interested

☐ 4

3. What is your overall assessment of the project?

Poor quality	1 2 3 4 5	Superior quality

☐ 5

4. List what you consider to be the three most significant needs/problems that students have.

_____

_____

_____

Thank you very much for your assistance.

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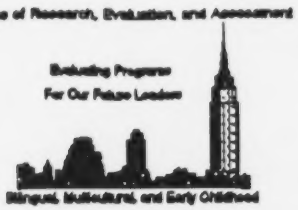
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Student Assessment

Spring 1993

Program: **Project LETAE** 3 8 (1)

Grade: _____ (3)

Directions: **Please write the numbers that show how you feel in the boxes on the right.**

1. Because of Project LETAE, I am more interested in continuing my education next year.

I am **NOT** more interested	1	2	3	4	5	I am much more interested	(5)

2. Project LETAE has helped me to do better in school.

Did not help me at all	1	2	3	4	5	Helped me a lot	(6)

3. Project LETAE helped me want to join after-school programs, clubs, or teams.

Did not help me at all	1	2	3	4	5	Helped me a lot	(7)

Thank you very much for completing this survey.